1.0 INTRODUCTION

On 24 July 2000, U.S. Environmental Protection Agency (EPA) Region III Superfund Removal Branch On-Scene Coordinator (OSC) Robert Kelly directed the Ecology and Environment, Inc. Superfund Technical Assessment and Response Team (START) to develop a sampling plan for the Sophia Battery Dump Site in Sophia, Raleigh County, West Virginia.

2.0 SITE DESCRIPTION

2.1 Location

The Sophia Battery Dump Site is located in a rural/residential area in the town of Sophia, Raleigh County, West Virginia. The site is located on West Railroad Avenue, upgradient from the Norfolk & Western Railroad tracks, as illustrated in Figure 1, Site Location Map.

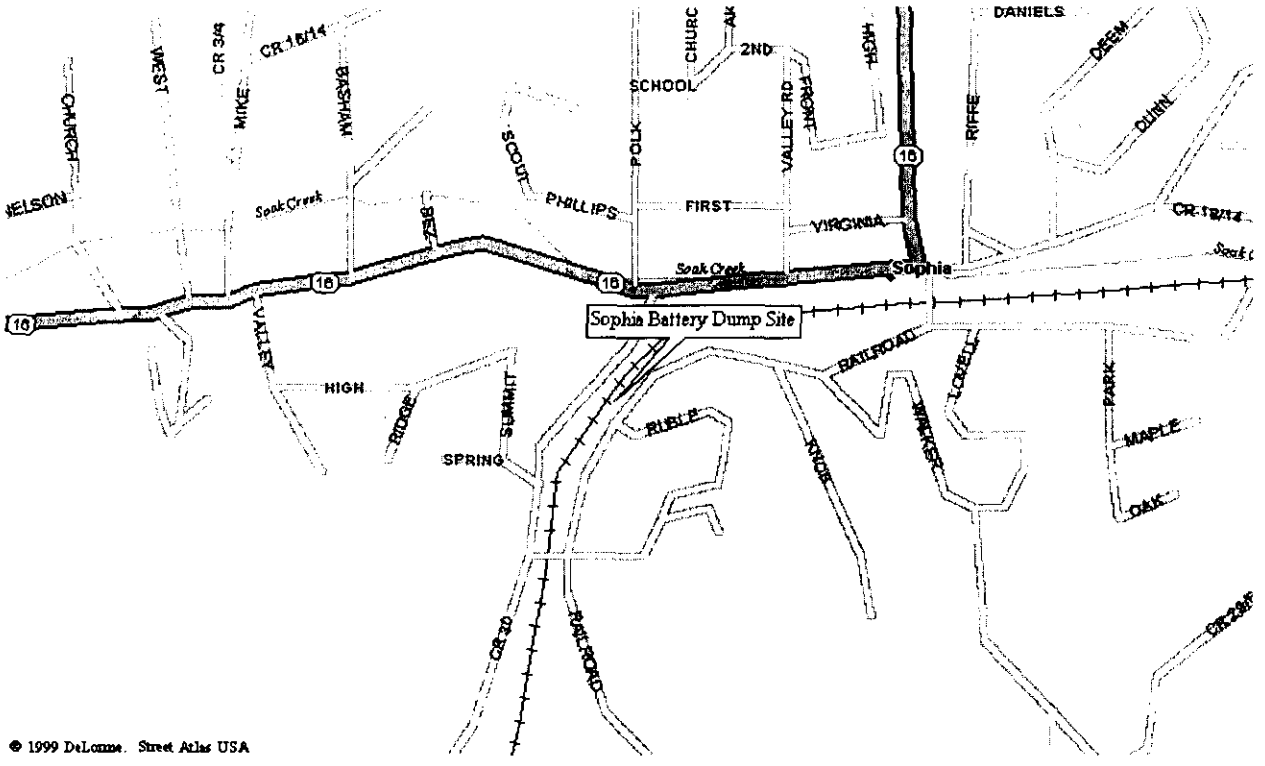

Figure 1
Site Location Map

2.2 Site Description

The Sophia Battery Dump Site is approximately 500 square feet in size. To the south and east of the site are a series of residential homes. The Norfolk and Western railroad, which runs parallel to the unnamed tributary of Soak Creek, is located to the north and west of the site. The site's topography is characterized as a sloping, wooded area. The site is heavily vegetated with weeds and plants. Surface runoff from the site migrates towards Soak Creek, which is a tributary of the Ohio River.

The site consists of an abandoned battery recycling facility, including four connected building sections, and its outlying soils. Two sections of the facility do not have a front wall, and the other two sections are not locked. Therefore, access to the facility and its outlying soils is unrestricted and there are no fences or signs posted along the site to prevent entry. Sections of the roof are leaking rainwater into the facility. The rainwater then migrates to the outlying soils. This rainwater, if contaminated, poses a threat to the tributaries of the Ohio River.

The outlying soils of the abandoned facility are covered with old battery casings, empty, smashed drums, and automobile fluid containers. The casings are spread out over the entire slope behind the facility, although not all of the casings were observed due to the heavy vegetation.

2.3 Background

On 27 January 1998, the West Virginia Department of Environmental Protection (WVDEP) responded to a complaint from an employee of Sophia Water Department. During excavation of a water line on West Railroad Avenue, the water department discovered plastic battery cases buried in the ground up to a depth of six feet. WVDEP contacted the property owner, [redacted], and obtained permission to collect samples from the property.

WVDEP collected a soil sample from the excavation pit and sent it for total lead and Toxicity Characteristic Leaching Procedure (TCLP) analysis. A tap water sample was also collected from a nearby resident. The results from sample collection revealed that the soil sample contained 3.7 parts per million (ppm) TCLP and a total lead concentration of 1,120 ppm. The tap water, which was found to contain 1.6 ppm lead, exceeded the Maximum Contaminant Level (MCL) of 0.015 ppm for drinking water. The West Virginia Department of Health and Human Resources (WVDOH) issued a water advisory in the area. As a result, the neighborhood water lines were flushed repeatedly. Following additional sampling and verification that the lead content in the water was below the MCL, the water advisory was lifted by WVDOH.

On 11 February 1998, WVDEP personnel conducted a preliminary assessment at the site and collected samples from the excavated pit, the embankment beneath a section of the building on site, and from a battery storage area at the north end of West Railroad Avenue. The analytical results showed that the soils contained lead up to 7,900 ppm and TCLP lead up to 130 ppm. Subsequently, on 8 July 1998, WVDEP Tom Blake requested EPA assistance to perform an emergency removal assessment. EPA tasked SATA to conduct a windshield assessment.

On 22 September 1998, OSCs Downie and Easton, accompanied by SATA, met with WVDEP Blake and conducted the windshield assessment. The site consisted of several small wooden buildings, formerly the ABD battery recycle company. The small wooden buildings hung over an embankment, which leveled off to a flat area, then descended down to the Norfolk and Western railroad tracks and an unnamed tributary to Soak Creek. According to [redacted], a resident at [redacted] West Railroad Avenue, the facility was no longer in operation. Several residences were located across the street from the site.

SATA observed battery casings at four distinct locations: adjacent to the stairs leading down the embankment, adjacent to the north end of the site, adjacent to the wooden recycling buildings, and in the embankment beneath the edge of the buildings. No lead pieces were observed. SATA constructed a sketch of these locations and documented the areas of concern.

EPA, WVDEP, and SATA discussed contaminant levels in the water with [redacted]. WVDEP did not recall any residents reporting levels of lead above the MCL in their water, but [redacted] claims that he had continued high levels of lead in his water.

SATA researched the location and ownership of the water, sewer, gas, telephone, and electrical utilities at the Sophia Town Hall. SATA obtained maps of all utility locations. Under direction of OSC Easton, SATA met with the town mayor, Daniel Barr. Mr. Barr assisted SATA in obtaining the utility contacts.

On 23 September 1998, SATA researched deed and PRP information, sampling data, and original reports at the Charleston WVDEP Office of Waste Management. SATA obtained copies of all pertinent information.

On 12 July 2000, OSC Kelly was directed to investigate the site. OSC Kelly directed START to accompany him during a windshield assessment on 23 July 2000.

On 23 July 2000, OSC Kelly and START mobilized to the site and investigated current site conditions. The OSC and START observed holes in the roof of the recycling facility, which allows rainwater to infiltrate into the building. This rainwater had the potential of carrying contamination from the facility through site surface water runoff and ground water and transport it into the unnamed

tributary of Soak Creek. Battery casings could be observed in the site soils from the railroad tracks adjacent to the site and from the roadside. The OSC and START observed two separate runoff streams emerging from the hillside located along the embankment of the site. These runoff streams entered the tributary of Soak Creek at locations adjacent to the railroad tracks. The OSC and START traced the path of this unnamed tributary, visiting residences along the way and confirming the path of the waterway.

OSC Kelly spoke to the water department in Sophia and confirmed that this waterway leads into Soak Creek and subsequently into the Ohio River. OSC Kelly attempted to contact the property owner, [redacted], and request access to the property for a sampling event. [redacted] was not available. OSC Kelly directed START to procure laboratory services and prepare for a sampling event the week of 14 August 2000. The site soils will require Target Analyte List (TAL) metals analyzation. These parameters are listed in Section 5.0, Analytical Parameters.

3.0 PROJECT DESCRIPTION

3.1 Objective

The sampling assessment has four objectives. First, to determine if the concentrations of lead that were previously detected during the sampling assessment in October 1998 are still present in the soil surrounding the facility. Second, to better define the lateral edges of the soils outlying the facility to determine where the associated contamination is present. Third, to determine if the lead and/or metals have migrated through the soil surrounding the building to the tributary of Soak Creek. Fourth, to determine if removal actions are necessary, which may include demolition of the facility and excavation of the soil surrounding the building.

3.2 Scope of Work

The scope of work includes collecting both surface and subsurface soil samples from locations designated by the OSC during the assessment. The soils surrounding the site will be blanketed in an attempt to locate the areas of contamination and to determine the extent of the contamination. A background sample will be collected in order to determine if the lead content in the soils is average for the area. Subsurface soil samples will be collected due to the burial of the battery casings in the soil; an attempt will be made to determine what degree the contamination has migrated. Along with soil samples, water and sediment samples will be collected from two runoff streams downgradient from the site, from locations upstream, between, and downstream from these runoffs, and from discretionary locations that will be determined on site. These runoff streams will be sampled to determine if the contamination on site is migrating towards the unnamed tributary of Soak Creek. The additional sample locations

are anticipated to be prior to and following this runoff stream, in an attempt to determine the average concentration of lead in the water of the area. This will be a one-time sampling event until further sampling and/or removal is determined necessary by the OSC. Table 1, Sample Locations, identifies the proposed sampling locations and their matrices. The proposed station locations for the water and sediment samples, along with the area in which the soil samples will be collected, are shown in Figure 2, Sample Location Map.

Table 1
Sample Locations

Sample Identifier	Matrix	Type of Sample	Location
SB01-SB10	Aqueous	Grabs and one Blank	Stations 1-10
SB11-SB19	Sediment	Grabs Corresponding to the Water	Stations 1-9
SB20-SB49	Soil	Surface	Stations 11-40
SB50-SB59	Soil	Sub-surface	Stations 11-19

3.3 Data Use

The data will be evaluated to determine if the contamination in the soils present on site is above EPA Emergency Removal Guidelines derived from the EPA Region III Risk-Based Concentration Table and if subsequent removal actions are necessary (EPA, 2000).

4.0 SAMPLING PROCEDURES

4.1 Sample Collection

Field work will begin with a site reconnaissance to identify appropriate sample locations. During the reconnaissance, the area will be monitored for any possible safety hazards, including radiation sources. EPA approved or START Standard Operating Procedures (SOPs) will be utilized whenever possible.

Following the site reconnaissance, sample collection activities will occur as summarized below. All sampling will be conducted using modified Level D personal protective equipment (PPE). An upgrade to Level C PPE may be required due to soil in the area having little moisture and creating dust; this upgrade will occur as determined by the site health and safety coordinator. START will follow the guidance described in the health and safety plan (HASP) for all sampling activities.

4.1.1 Soil Matrix

In accordance with START SOP Geotech 5.17A, Soil Sampling (START, 2000), a total of 36 soil samples and four field duplicate samples will be collected. All soil samples will be collected as grab samples using disposable plastic scoops.

An eight-ounce clear wide-mouth (CWM) glass jar with a teflon-lined lid will be used as a collection container for each sample. On each jar, a label will be placed with the description, date, time, and sample personnel. The samples will be analyzed for TAL Metals, as listed in Section 5.0, Analytical Parameters.

4.1.2 Sediment Matrix

In accordance with START SOP Env 3.8, Sediment Sampling (START, 2000), a total of nine sediment samples will be collected. All nine sediment samples will be collected from two or more runoff streams and locations upstream and downstream from the runoff streams, which will be designated during the site reconnaissance. All sediment samples will be collected as grab samples using disposable plastic scoops. An eight-ounce CWM glass jar with a telflon-lined lid will be used as a collection container for each sample. On each jar, a label will be placed with the description, date, time, and sample personnel. The samples will be analyzed for TAL Metals, as listed in Section 5.0, Analytical Parameters.

4.1.3 Water Matrix

In accordance with START SOP Env 3.12, Surface Water Sampling, a total of ten water samples will be collected (START, 2000). One of these ten samples will be collected as a field blank. The other nine will be grab samples collected from two or more runoff streams and locations upstream and downstream from the runoff streams, which will be designated during the site reconnaissance. All water samples will be collected in one-liter polyethylene bottles, and will be preserved with Nitric Acid to a pH >12. START personnel will utilize pH paper during sampling to determine if the samples are properly preserved. The samples will be analyzed for TAL Metals, as listed in Section 5.0, Analytical Parameters.

4.2 Sample and Equipment Decontamination

No decontamination of sampling implements will be necessary due to the use of disposable equipment. All personal protective equipment (PPE) and disposable sampling equipment will be double-bagged and disposed of as dry industrial waste. Decontamination of sample jars shall be done according to START SOP PCP Tech 7.11, Sampling Equipment Decontamination (START, 2000).

5.0 ANALYTICAL PARAMETERS

Table 2 below provides a summary of the matrices to be collected, parameters to be analyzed, analysis methods, sample containers needed, and detection limits required for this sampling event. Listed below are the sample analyses requested by matrix and the sampling containers, preservatives and analytical methods.

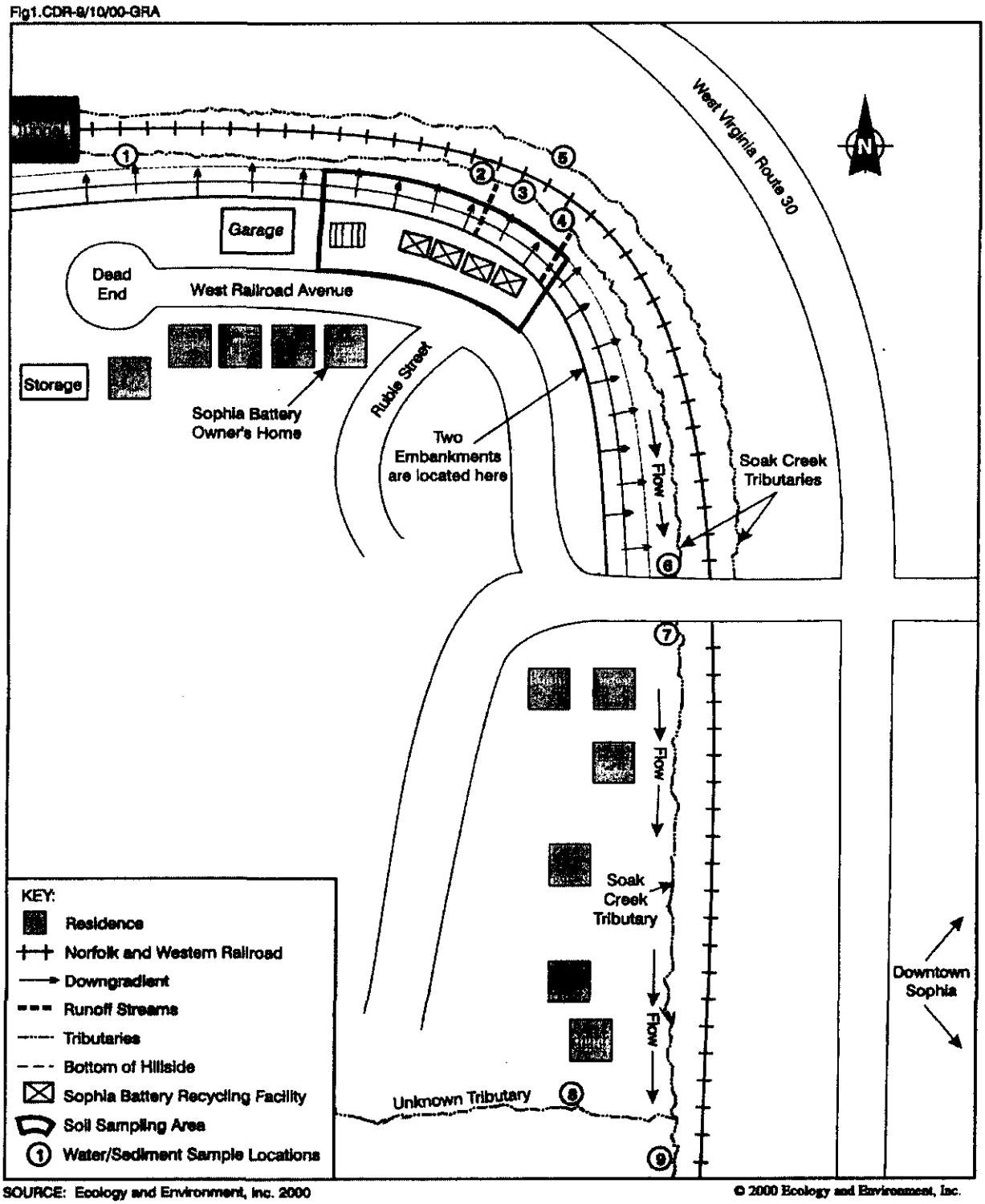

Figure 2
Sample Location Map

Table 2
Summary of Analytical Parameters

Sample Location	Matrix	Analytical Parameter	Test Method	Containers Used Preservatives Used	Special Detection Limits Needed
Stations 1-10	Aqueous	TAL Metals	CLP SOW ILM04.0	1-L Poly 4°C	CRDL
Stations 1-9	Sediment	TAL Metals	CLP SOW ILM04.0	8-oz. CWM 4°C	CRDL
Stations 11-40	Soil	TAL Metals	CLP SOW ILM04.0	8-oz. CWM 4°C	CRDL

CRDL = Contract Required Detection Limit
CWM = Clear Wide Mouth

6.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) PROCEDURES

This sampling plan is designed to satisfy the QA/QC Guidance for Removal Activities, EPA/540/G-90/004, April 1990, QA Level II criteria.

6.1 Quality Control of Field Activities

The SATA Site Leader will be responsible for ensuring that sample quality and integrity are maintained in accordance with the QA/QC Procedures, and that the sample labeling and documentation are performed as described in Section 6.2 of this sampling plan.

6.2 Sample Packaging and Storage

In accordance with START SOP PCP Tech 7.12, Sample Packaging and Shipping, sample containers will be labeled and shipped with a sample tag affixed to each container (START, 2000). Samples will be placed in plastic zipping bags. Bagged containers will be placed in appropriate transport containers and the containers will be packed with appropriate absorbent material, such as vermiculite, and preserved with ice, if necessary. All sample documents will be affixed to the underside of each transport container lid. The lid will be sealed with shipping tape and custody seals will be affixed to the transport container. Transport containers will be labeled with the origin and destination locations.

Regulations for packaging, marking, labeling, and shipping of hazardous materials and wastes are promulgated by the U.S. Department of Transportation (DOT). Air carriers which transport hazardous materials, in particular, Federal Express, require compliance with the current International Air Transport Association (IATA) Regulations, which apply to the shipment and transport of hazardous materials by air carrier. SATA will follow IATA regulations to ensure compliance.

6.3 Field QC

Field QC will consist of one field duplicate for every ten soil and/or sediment samples, along with sample documentation as referenced in START SOP Doc 2.1, Logbook Documentation (START, 2000). The field blank will aid in identifying possible contaminants introduced during collection activities. The field duplicate will test the reproducibility of sampling procedures and results.

6.4 Laboratory QC

Laboratory QC will consist of initial and continuing calibration standards, Inductive Coupled Plasma interference standards, digestion logs, and all raw data. Matrix spikes, method blanks, and duplicate samples will be done at a rate of one per twenty for the soil samples.

6.5 Data Validation

Data validation will be performed by SATA members using the EPA guidance listed in Section 6.0. A data quality report will be prepared to summarize the data validation activity, and to present any concerns regarding data quality.

7.0 REPORTS

Information gathered from this sampling event will be compiled into a trip report. The report will include the data collection methods, sample locations, data summary tables, maps, diagrams and a data quality report. The trip report will be submitted to EPA upon completion.

8.0 REFERENCES

EPA (U.S. Environmental Protection Agency). 1998. EPA Region III Risk-Based Concentration Table. Philadelphia, PA. 15 April.

START (Superfund Technical Assessment and Response Team). 2000. *Compendium of Standard Operating Procedures*. Lancaster, NY.

DeLorme. 1999. *Street Atlas USA, Version 7.0.* Yarmouth, ME.